Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of Inquiry Regarding Carrier Current Systems Including Broadband over Power Line Systems By W. Lee McVey, P.E. To: The Commission	)	**ET Docket No.** 03-104

REPLY TO COMMENTS OF ELECTRIC BROADBAND

The following are in response to the Comments of James A. Stenger, counsel to Electric Broadband, filed July 7, 2003.

A. BPL Is the End of the Line

1. Electric Broadband characterizes BPL as an extension off the end of a utility's fiber optic network, yet says that a utility typically cannot justify extending its fiber optic system in the hope of attracting a customer base.[1] Yet, its own description, in the Summary to Comments includes a statement that BPL is a "last mile technology" whose

[1] Comments of Electric Broadband, (July 7, 2003) P.1

extension will result in increased penetration of fiber into service areas.

2. So, like the United Power Line Council, Electric Broadband tells us that BPL is merely a "crutch" technology to bait and hook the customer, then at some future date, and as additional subscribers appear, utilities would just shift the "end of the line", "last mile" technology on down the line.

3. But, realistically, what constitutes a sufficient number of customers to connect and extend fiber optic systems so that those who live, say 10 to 15 miles out on a rural distribution feeder, will be offered this service? Is it one per mile, two per mile or 50 per mile to justify moving beyond the first mile from a substation and the utility fiber network?

4. Over the years, electric utilities have been required to extend their systems to serve customers. Filed tariffs have permitted utilities to charge line extension fees when sufficient revenue was not immediately available, and in most cases, refund such fees later on, if sufficient customer revenue appears to cover the cost of system extension. Apparently, that approach isn't desirable here. But, why not? If it's good enough for electric and gas service, why shouldn't it be just as applicable to broadband service supplied by electric companies who already use this approach to extend their facilities?

B. Smart Build Isn't Smart

5. Smart build, as Electric Broadband describes it, is a concept whereby the BPL "end of the line" would be shifted further down the line, as customer revenue appears. As in the

above hypothetical, perhaps rural customers may never see the benefit of broadband service, if the utilities wait until and if subscribers generate enough revenue to extend fiber and move BPL further out.

6. The "smartest" build-out approach would involve 5GHz wideband pole-top digipeaters that would accomplish the Commission's desire of high speed rural broadband service, and not require build out of fiber optic infrastructure to as great an extent. And, interference to other telecommunications services would, of course, not be an issue.

C. No Interference (or Antennas) Seen

7. Electric Broadband hasn't "seen interference issues arise under the existing CCS rules."[2] Did Electric Broadband conduct its testing or report the testing of others immediately adjacent to a licensed HF facility, such as one of the FAA's regional air traffic control centers employing HF communications equipment in order to make such a statement valid? Of course, a careful inspection of proposed BPL test areas would reveal the presence of HF radio antennas and make a test site objective of avoiding any possible complainers rather simplistic.

D. Changing Part 15 Limits Is Not the Answer

8. Electric Broadband does not wish to accept that licensed services are not to be subjected to interference. In fact, if Electric Broadband were to have its way, third parties such as CATV and telephone and licensed HF users "must be held responsible for

[2] **Id**, ¶ II., P 3.

taking steps to mitigate their vulnerability to interference."[3] Such attitudes reflect a blatant, intentional disregard for the provisions of Part 15, which clearly require the protection of licensed services from interference. Yet, ironically, Electric Broadband later acknowledges the need for CATV systems to protected licensed VHF aircraft communications.[4]

E. Overhead Line Construction Requirements Unclear

9. ANSI C2, The National Electric Safety Code (NESC), contains minimum separation requirements for overhead medium voltage distribution lines from communication conductors and from buildings and other structures. Electric Broadband infers that the separation between medium voltage and communication levels is such that no cross coupling would occur (*emphasis added*). A six-foot vertical separation is required from communication conductors where no low voltage lines are underbuilt and roughly nine feet, where low voltage conductors are present. Additionally, communication conductors are periodically bonded to common and primary neutrals. Such bonding takes place at typically 18 to 25 feet above ground level. As such, geometries could result in significant coupling between the medium voltage primary and communication conductors below.

F. Medium Voltage Lines Are a Residential Environment

10. Electric Broadband makes the claim that medium voltage lines cannot be characterized as a residential environment, inferring once again that such lines are at a significant distance from residential structures. While it is true that the NESC does limit

[3] **Id.** ¶ A3a, P.6
[4] **Id.** ¶ A3b, P.7

the separation both vertically above and horizontally from structures, it can be as close as 10 feet or so, depending on the operating voltage of the medium voltage line.[5]

G. Overly Scrutinous Investigation of BPL

11. Electric Broadband makes the claim that other broadband and network configurations would not have passed the scrutiny that the NOI focuses on BPL.[6] Quite simply, sound engineering design employing balanced lines, shielding and other mitigation techniques have enabled Ethernet, DSL, and even CATV to co-exist with licensed systems. It is my belief that the Commission has recognized the interference potential of BPL to licensed services and wishes to investigate thoroughly the potential pitfalls of the technology prior to its widespread, non-selective deployment.

H. Conclusions

12. BPL is a 'last mile' concept. As such, existing electric utility fiber optic systems must be extended to the last mile to interconnect with BPL to achieve satisfactory throughput. Since technologies exist to provide both electrical conductor and fiber optic cores in one bundled, stranded cable, there is little reason why fiber core power cables could not be extended the entire length of distribution feeders directly to the customer, when facilitated with advanced, refundable cost of ownership customer payments. Especially when such practices have been used for decades to extend electric utility systems to serve new customers. Or, at least to distribution transformers or other strategic points where a proven, high speed wireless technology, such as IEEE 802.11(b)

[5] **Id**. ¶ A4, P.8
[6] **Id**. ¶ B, P.11

or 5GHz wideband could be employed for the last 100 to 1000 feet or more to supply multiple customers with high speed two way Internet and perhaps even other services which are now unavailable outside urban areas. Also, with elevations of 30 to 45 feet above average terrain at pole-top, and wireless hub devices geographically centered, perhaps several rural customers could be served from one wireless hub overhead location. Power system reconfiguration obstacles for fiber optic bundles could be resolved by simply bypassing fiber optic core tubes around electrical switches, allowing rearrangement of power flow without disrupting data service routing. Or, alternatively, installation of fiber core conductor as overhead common neutral would avoid switches altogether.

Respectfully Submitted,

/s/

W. Lee McVey, P.E.
Senior Member, IEEE
PG-12-19879
W6EM
1301 86th Court, NW
Bradenton, FL. 34209-9309
August 19, 2003